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TSARA

International Seminar on the Preservation and Restoration of Forest Soils in West Africa

Abidjan, May 15th-17th 2023

Synthesis report

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Context

Soil degradation affects more than a third of the world's land. It is a global issue because of its impact on food security, biodiversity, desertification and climate change. Over the past decade, these issues have been taken into account by several international initiatives (e.g. the "4 for 1000" Initiative, the Global Soil Partnership). In West Africa, the recent holding in Côte d'Ivoire of the Conference of the Parties (COP15) to the United Nations Convention to Combat Desertification highlighted the interconnected challenges of land and soil degradation, drought and climate change. While the impacts of soil degradation in the arid and semi-arid zones of West Africa are now in the spotlight, the threats to soils in the humid tropics must not be overlooked. In the humid tropics, the rapid depletion of the fertility of soils coming from deforestation is jeopardizing the agricultural and forestry production systems of these countries and the people who depend on them.

In the forested countries of West Africa's coastal strip, such as Côte d'Ivoire and Ghana, the success of cash crops (cocoa, coffee, rubber, palm, etc.) has been built on rich soils derived from forest cover. The disappearance of more than 80% of this forest cover since 1900 in West Africa threatens the sustainability of these production systems. In these post-forest conditions, renewing ageing cocoa plantations is a major challenge for producers.

In many regions, demographic pressure limits the possibility of fallowing food-producing land between crops. This results in a long-term loss of overall soil fertility, and leads growers to resort to costly chemical inputs, which ultimately exacerbates the loss of soil fertility. Soil restoration also has a potential for mitigating and adapting to climate change that is poorly assessed and not integrated into the mitigation and adaptation climate strategies of West African countries.

All the direct and indirect benefits of soil restoration are the very foundation of the "4 per 1000" Initiative: soils for food security and climate (www.4p1000.org). Launched in 2015 at COP 21 of the United Nations Convention on Climate Change, this initiative consists of federating all voluntary public and private players to show that soils can play a crucial role in food security and the fight against climate change.

The government of Côte d'Ivoire is a member of the "4 per 1000" Initiative and is implementing the Terri4Sol project (www.terri4sol.org) to restore Côte d'Ivoire's forest soils and landscapes. Coordinated by the Ministry of State for Agriculture and Rural Development (MEMINADER) and the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), this project aims to promote the preservation and restoration of organic carbon stocks by taking into account the multifunctionality of territories combining agricultural, forestry and post-forestry dimensions. Its aim is to demonstrate that it is possible to reconcile reduced pressure on forest land, economic development, food security and climate change mitigation.
In this context, it was particularly relevant to organize a seminar in West Africa bringing together political players, scientists, civil society representatives and farmers concerned by the challenges of preserving/restoring forest/post-forest soils.

Objectives

The seminar had three main goals:

1. Facilitate a dialogue between scientists, policymakers, and farmers on the vulnerability of forest soils in West Africa;
2. Elevate these issues on the sub-regional political agenda;
3. Promote knowledge and experience sharing among West African representatives and international organizations active in this field.

More specifically, the seminar sought to:

i) Share the most recent scientific research on soil fertility, its decline after deforestation, and the value of sustainable organic carbon management;
ii) Identify public policies and initiatives that contribute to the preservation and restoration of West Africa's forest soils;
iii) Showcase innovative social and technical solutions developed by farmers and other local stakeholders;
iv) Define strategic objectives for integrating these concerns at a sub-regional level.

To realize these goals, the seminar partnered with ECOWAS and engaged a wide range of participants including governmental institutions, scientists, civil society groups, and those in the agricultural and forestry sectors. This broad engagement was facilitated by partnerships with networks such as MEMINADER, the "4 per 1000" Initiative, and CIRAD, who co-hosted the event.

The 94 participants in the international seminar on preserving and restoring forest soils in West Africa.

Program

Day 1, May 15, 2023 - Welcome speech

Day 2, May 16, 2023

08:30 - 09:00 Registration and opening of the poster exhibition

09:00 - 09:30 Opening by Ibrahim Mayaki (4per 1000 Initiative - online), Christian Cilas (CIRAD), Rodrigue N'Guessan (MeMINADER)

09:30 - 11:00 **Soil Vulnerability in West Africa Post-Forest Landscapes**

Keynote moderator: Ebagnerin Jérôme Tondoh (Université Nangui Abrogoua, Abidjan)

Karidia Traoré (Université Jean Lourougonon Guédé, Daloa), Tiphaine Chevallier (IR D), Guy Yao Fernand (CNRA), Lucie Temgoua (Université de Dschang)

11:30 – 13:00 **Challenges of Land and Soil Degradation**

Moderator: Julien Demenois (CIRAD)

Borgui Yerima (ECOWAS/ARAA - online), Roel Houdanon (Land and Health Association/Youth Rep. CA4SH), Joséphine Georges (ROPPA), Maximin Djondo (BEES), Germain Hounkponou (IDH)

14:30 - 17:00 **Innovative and Sustainable Strategies to Combat Land Degradation**

Parallel sessions

Session I: Agro-ecological transitions

Moderator: Ebagnerin Jérôme Tondoh (Université Nangui Abrougoua, Abidjan) Célestin Lasme (GIZ), Ambroise Nko (Agneby Program), Edi Constant (Cooperative SOC IMAA)

Session II: Multifunctionality of post-forest landscapes

Moderator: Bruno Hérault (CIRAD)

Rolande Ettien (Nitidae), Hervé Aholoukpè (INRAB), Jean-Luc Kouassi (INPHB)

Day 3, May 17, 2023

09:00 - 11:30 **Innovative and Sustainable Strategies to Combat Land Degradation**

Parallel sessions
Session III: Agroforestry
Moderator: Patrick Jagoret (Cirad)
Lydie Lardy (IRD, SoCA Project), Fulbert Dago (AVSF, Equity Project)
Session IV: Soil fertility management
Moderator: Dominique Masse (IRD)
Youssouf Touré (LONO), Abou Bamba (Abidjan Legacy Program), Koné W. Armand (UNA)

13:30 - 15:00 **Science-Policy Dialogue Mechanisms**

Moderator: Carolina Milhorance (Cirad)

Chimère Diaw (African Model Forest Network), Selim Louafi (CIRAD - online), Hermann Brouzro (FIRCA), Leah Aoko (ARIN)

15:15 - 16:00 **Overview of Financial Mechanisms**

Alain Karsenty (CIRAD- online)

16:00 - 17:00 **Synthesis and conclusion on the main lessons of the seminar**

Drissa Traoré (MeMINADER), Jean -Paul Laclau (CIRAD), Paul Luu (4p1000)
Closing speech by Rodrigue N'Guessan (MeMINADER)

Opening

Roundtable Soil Vulnerability in Post-forest Landscapes of West Africa

Prof. Karidia Traoré from the University of Daloa highlighted the consequences of Côte d'Ivoire's intensive agriculture practices since the 1960s, focusing on the degradation of forest soils. The unchecked deforestation combined with unregulated forest degradation over the decades has significantly eroded and impoverished soils. The pervasive use of chemical inputs, especially non-selective and persistent pesticides, has not only polluted the environment but also disrupted the natural balance of the soil, diminishing its fertility and microbial life. As a result of these practices, soils have become depleted and struggle to regenerate their organic content, threatening the long-term viability and productivity of agricultural endeavors. It's clear that a combination of regulatory measures, improved management practices, and awareness campaigns are essential to restore the health of forest soils in Côte d'Ivoire.

In another presentation, Dr. Tiphaine Chevalier from IRD underscored the significance of soils in forest and post-forest ecosystems, rich reservoirs of organic carbon. These soils, integral to many ecosystem services including food production and carbon storage, play a pivotal role in environmental health. The quality and quantity of soil organic carbon, a dynamic mixture, serve as an indicator of soil vulnerability impacting areas such as agricultural output, food security, and land sustainability. Various assessment methods, both direct and indirect, help gauge the organic carbon's quality and turnover rates. Monitoring these metrics is essential for informed soil management decisions. Initiatives are underway, with scientific observatories emerging to keep track of ecosystem carbon changes.

In a third talk, Dr. Guy Fernand Yao presented CNRA's extensive research on soil landscapes. The research covered 166,140 surveyed areas, 14,208 observation points, and collected 56,832 soil samples. This data was used to create detailed maps of soil characteristics in both pre-forestry and forestry zones in Côte d'Ivoire. CNRA also rolled out actionable plans for sustainable soil management, specifically targeting crops like cocoa, coffee, rubber, and oil palm. Decision-making tools have been developed to guide farmers in selecting suitable areas for cocoa and coffee cultivation and tailoring their farming practices to local soil and climate conditions. The organization has also set up guidelines for fertilization and introduced agroforestry techniques to improve soil fertility. In short, CNRA is actively working to make agroecosystems more resilient in Côte d'Ivoire.

Concluding the session, Prof. Lucie Temgoua from the University of Dschang highlighted the importance of agroforestry in creating resilient forest landscapes in Central Africa. She pointed out that soil and forest vulnerabilities stem from various factors like deforestation, forest degradation, logging, mining, and expansion of agricultural lands. Agroforestry offers a solution by integrating practices such as improved fallow lands, tree intercropping, living fences, and alley cropping. These practices serve multiple purposes: they preserve woody diversity, protect against soil erosion, and aid in biodiversity conservation. Cocoa and coffee-based agroforestry systems are particularly popular in Central Africa. They not only enhance agricultural productivity but also contribute to species diversity and carbon storage in the soil. While these agroforestry systems have their challenges, such as the costs of maintenance and limited availability of suitable plants, they hold promise for mitigating deforestation and forest degradation. In conclusion, the promotion of agroforestry is vital for balanced forest management plans in Central Africa, and there's a need for initiatives that guide farmers in merging agricultural production with ecosystem conservation. Integrating agroforestry into payment schemes for ecosystem services can also encourage its wider adoption.

• The balance between tree presence and profitability was explored. The point was made that agroforestry can be a profitable practice if farmers actively engage in it. If they don't, it won't be profitable. It was suggested that targeted research could help farmers maximize the benefits of agroforestry.

• Concerns were raised about the current indicators for soil degradation and restoration. Farmers felt that these indicators are not sensitive enough to quickly reflect changes. The need for developing more responsive metrics was discussed.

• The National Center for Agricultural Research (CNRA) was highlighted for its role in implementing fertility management strategies. The use of digital mapping to create Decision Support Tools (DSTs) was noted, as were ongoing efforts to develop web mapping systems in collaboration with the Coordination and Consultation Committee (CCC). It was clarified that these maps would be available in the short term, as data compilation is needed to update existing ones, expected to be complete by 2025.

• The adverse effects of pesticides and herbicides were discussed. While their use is common, the impact is less severe on export-oriented crops due to certification requirements. In contrast, the damage to vegetable crops is significant. The approval process for pesticides was noted to be cross-sectoral, and many illegal products are in circulation. Furthermore, it was acknowledged that there is limited knowledge about the health impacts of these products, with cases of poisoning often manifesting as chronic conditions, complicating immediate cause-effect determination.

• The issue of collecting specific data on soil vulnerability for various social groups was raised. It was noted that such data do exist but have not yet been fully analyzed.

Roundtable on the Challenges of Land and Soil Degradation

According to ECOWAS, healthy soil is crucial for sustainable agriculture in Africa. This session brought several key areas into focus.

Firstly, political challenges require attention. For successful soil restoration, we need robust financial and technological support at every level. These resources should be available to a broad base of farmers. To make this transition successful, there needs to be a close collaboration between farmers, research institutions, and policymakers through national dialogues. Farmers bring valuable insights and need to be actively listened to. Awareness of the benefits of soil restoration is also essential to encourage farmer participation. ECOWAS advocates for agroecology as an all-encompassing strategy for soil health. The session also touched upon the importance of multi-level solidarity—local, national, and regional.

Soil health also intersects with food and health security. Depleted soils result in lower yields, and keeping soil fertile demands proper knowledge and land management. Overuse of fertilizers and other inputs harms both the soil and water reserves, making hands-on, field-based training indispensable.

Biodiversity conservation is another vital component. Various factors like climate change, pollution, and changing land uses are leading to biodiversity loss, essential for soil health. Adopting sustainable farming practices can cut the negative impact on soil biodiversity by up to 24%.

Climate change is another angle to consider: wetland soils, for instance, serve as effective carbon sinks. The CA4SH organization is collecting national soil health data, including carbon sequestration and biodiversity indicators. However, Africa needs better methods to evaluate progress towards its environmental goals.

From the farmers' perspective, economic resilience in the face of climate and demographic changes is crucial. Farmers need access to practical, affordable tools and training on sustainable, low-cost solutions like composting and organic fertilizers. Practices like agroforestry have enabled farmers in Niger to cultivate once-degraded lands, securing a sustainable income. Diversifying income sources and developing new markets and soil-focused certifications are also key. Water management was identified as another crucial element, especially since farmers can't rely solely on rainfall.

Roundtable Science-Policy Dialogue Mechanisms

The roundtable aimed to critically examine the challenges, misconceptions, and effective approaches for facilitating dialogue between scientists and policymakers.

Selim Louafi from CIRAD opened the discussion by setting the conceptual framework. He was followed by Leah Aoko, who shared insights from the ARIN network on fostering science-policy dialogue in Africa, specifically in the context of climate change adaptation. Herman Brouzo then contributed lessons from FIRCA's experience in Côte d'Ivoire, discussing how to institutionalize and fund these dialogues. Finally, Chimère Diaw explored these issues using his extensive experience at both the sub-regional and international levels, focusing on institutional conditions and challenges that exist within the science-policy nexus.

Participants underscored the need for a strategic vision when working to transform agricultural and food systems. The discussion highlighted the importance of incorporating political considerations into scientific research. This means scrutinizing, clarifying, and taking into account the political aspects related to research goals, scientific methods, and desired outcomes. Emphasizing this political dimension calls for a more pluralistic approach in science, incorporating interdisciplinary and transdisciplinary methods, and requires collaborative guidelines to validate the solutions proposed. The pitfalls of research that is too directive were also noted.

Therefore, science-policy dialogue encompasses a collective learning process and the framing of public issues, in which researchers are active participants. Beyond the mere act of informing or enlightening political decisions, researchers have a crucial role to play in co-constructing both the issues at hand and crafting solutions that are more suitable and contextually relevant. With this perspective in mind, the discussion began with the recognition that science-policy dialogue is a complex process involving learning and negotiation among various communities, all while considering socio-political and structural factors.

The debate emphasized that scientific research findings are often overlooked in policies across Africa. Moreover, such data remains scattered and largely invisible in political discussions. Given this context, the need for better consolidation of research findings and closer collaboration with political stakeholders was clear. This should account for challenges like the complexity of study results and the unique needs of target groups. One key point is the need to understand the perspectives of local actors. For example, a participant noted that farmers clearly understand the relationship between cocoa production and the surrounding tree environment. Such insights could be invaluable for promoting initiatives like agroforestry.

The discussion suggested that research should not only be designed to include the concerns of these local actors but also aim to translate findings into actionable political messages. Research can also play an advocacy role in elevating certain issues on the public agenda. Scaling up innovations emerged as a significant challenge—how can we facilitate broad adoption and systematic replication of successful practices? Social entrepreneurship was proposed as a possible strateegy, offering the chance to create a supportive business ecosystem.

Finally, participants highlighted the importance of reflective research and a move toward more collaborative approaches. There was also a call to avoid ranking scientific and practical knowledge, as both are essential for crafting solutions to challenges like soil degradation.

Overview of Financial Mechanisms: GHG Reduction Markets and Carbon Credits

Alain Karsenty from CIRAD presented some of the key financial mechanisms of the climate regime and discussed their relevance in addressing the challenge of forest degradation.

The talk started by explaining that the 1997 Kyoto conference introduced the idea of a "cap-and-trade" emissions permit market. By 2001, rules for a "flexibility mechanism" were established. This shift allowed the creation of "carbon credits" through emission reduction projects, particularly in developing countries, known as the Clean Development Mechanism (CDM). These credits could be used by Northern companies to offset their emissions beyond their allotted quotas. However, "avoided deforestation" projects were not included in the CDM. The CDM ended in 2020, but CDM credits are still available for purchase.

To address the exclusion of forest conservation, developing countries proposed the REDD+ payment mechanism to the United Nations Framework Convention on Climate Change (UNFCCC) in 2005. REDD+ measures results at the national level, and projects cannot issue carbon credits.

Dissatisfied with this centralized approach, "carbon" investors and NGOs began developing carbon offset projects outside the UNFCCC. These projects, also called REDD+, create carbon credits sold in the "voluntary market" to companies aiming to achieve "carbon neutrality" beyond their regulatory obligations. Private certification organizations, led by VERRA, dominate the forest credit market. Recent reports suggest that over 90% of VERRA-certified credits may not represent additional emissions reductions. Additionally, forest projects face challenges such as non-permanence due to factors like fires and land conversion, as well as leakage risks as deforestation pressures may shift elsewhere.

At COP 26 in Glasgow, most of the rules for Article 6 of the Paris Agreement were established. This article governs international transfers of emissions reductions. It allows emissions reductions or carbon sequestration at the national level (Art. 6.2) or from projects (Art. 6.4, succeeding the CDM), but only if they align with the Paris Agreement's requirements for an absolute reduction trajectory.

Parallel Sessions

During these sessions, participants were encouraged to explore the themes of agroecological transitions, the multifunctionality of forest landscapes, agroforestry, and soil fertility management. For each, the central drivers, obstacles, and the overarching global challenges that these approaches entail were examined and discussed.

01 Agroecological transitions

The "agroecology" session delved into multiple facets of the field, starting with the impact on farmers' incomes. The discussions also explored how agroecology is linked to the health of both producers and consumers, as well as to changing market dynamics. Faced with the volatility of agricultural input prices, participants expressed a strong interest in reducing dependency on agrochemicals. The conversation then shifted towards the potential of agroforestry, which typically requires fewer mineral inputs. A significant emphasis was placed on the importance of building and disseminating knowledge—a fundamental element of agroforestry. This discussion also highlighted the need for more robust public policies. Land use and ownership issues received substantial attention, as did the market for organic farming inputs. The session concluded with a call for stricter regulations governing the import and use of chemical inputs.

Parallel Sessions

02 Multifunctional Forest Landscapes

The multifunctional roles of post-forest landscapes could serve as valuable tools for enhancing food security, stabilizing local incomes, and fulfilling international commitments. These landscapes can also help address issues related to land-use conflicts and diminishing land availability. To fully harness this multifunctionality, there's a need for inclusive governance involving multiple stakeholders, targeted economic incentives, and dedicated technical support. Currently, the lack of coordinated political effort and limited cross-sector collaboration hinder the full realization of these landscapes' multifunctional potential.

Parallel Sessions

03 Agroforestry

The session on agroforestry shed light on the interconnected challenges of economic and environmental issues. These challenges range from boosting agricultural income and controlling biological pests, to enhancing soil fertility and addressing climate change and deforestation. Agroforestry was highlighted as a promising approach to meet many of these challenges. The session provided an opportunity to tackle technical hurdles and engage with the scientific community for the joint development of more practical agroforestry applications. This is particularly relevant in a context marked by the strenuous nature of this kind of work and labor shortages. Moreover, the session brought attention to the uncertainty surrounding the applicability of existing legal frameworks for the management of trees and land, identifying it as a significant barrier. Other economic constraints, such as the costs of implementation, were also discussed, along with a disproportionate focus on the cocoa industry alone. Lastly, international policies related to imported deforestation were considered as avenues for expanding the adoption of agroforestry.

Parallel Sessions

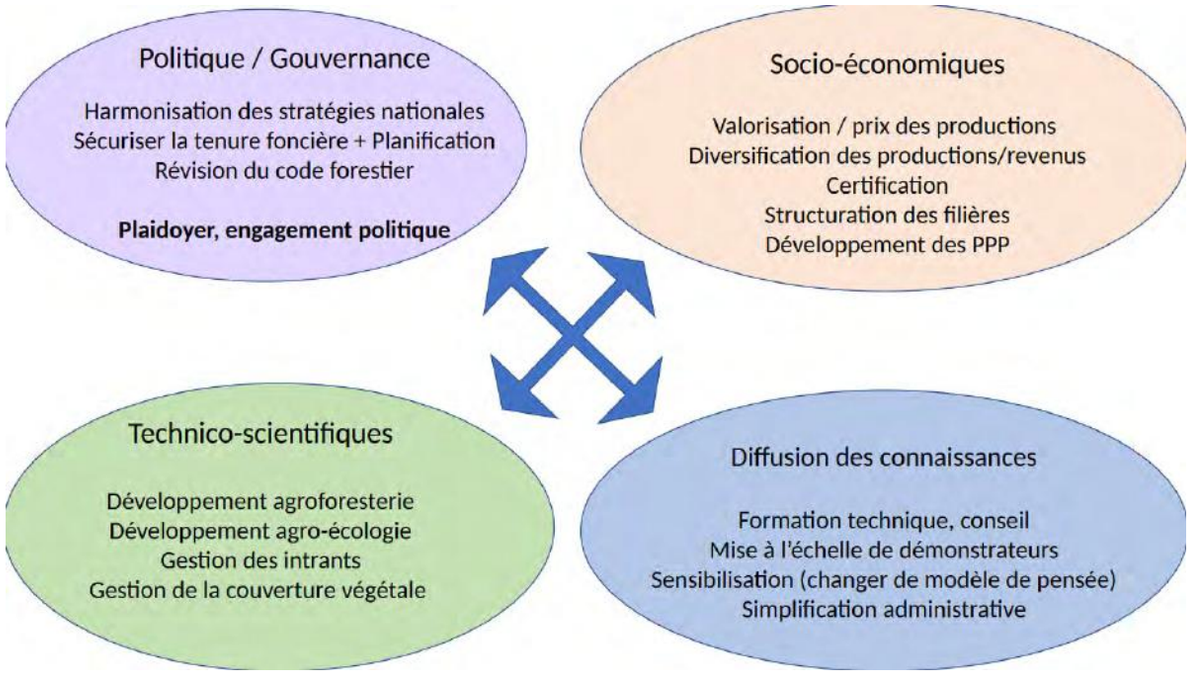
04 Soil Fertility Management

The session highlighted the intricate balance between socio-economic goals like increasing income and yields, environmental objectives such as soil conservation and climate resilience, and societal needs including food security and land conflict resolution. Various strategies were identified to address these challenges, spanning from technical measures like rational fertilizer use and organic input certification, to knowledge dissemination that respects local wisdom and promotes accessible research and development outcomes, as well as policy interventions to bolster agroecology and input supply structures. However, participants acknowledged that several barriers still remain. These range from financial constraints like limited access to funding, to gaps in educating and connecting producers with research, slow adoption of innovations, and policy-related roadblocks such as lack of political will and lengthy approval processes for inputs. Global issues, including financial crises, were also noted as hindrances.

Parallel Sessions

SYNTHESIS

Participants in all sessions agreed that modifying existing production methods could address various environmental and socio-economic issues. Environmentally, this includes challenges like climate change—which requires both adaptation and mitigation—soil degradation, loss of biodiversity, and concerns related to water quality and availability. From a socio-economic perspective, such changes could enhance farmers' resilience and income by diversifying production systems and reducing reliance on external resources, ultimately leading to improved food security.



Illustrated summary of parallel sessions

Parallel Sessions

SYNTHESIS

In the four parallel sessions, participants consistently identified similar factors that could either facilitate or hinder the adoption of the four different approaches under discussion. These factors fall into three key categories:

- ***Knowledge Sharing and Creation***: All groups expressed a strong interest in solutions based on scientific research that also promote innovation. In addition to generating results, it's crucial for science to be responsive to the needs of both farmers and policymakers, while incorporating traditional wisdom. This creates a dynamic and interactive knowledge-building process. Special emphasis was placed on skill development as a critical component for transitioning to more sustainable agricultural practices.

- Policy and Governance: Participants emphasized the need to create and implement policies that drive substantive change and encourage sustainable production methods. They identified structural obstacles, such as land ownership and the legal classification of trees, as critical factors. A recurring theme was the disparity between stated goals and their actual implementation. The importance of economic incentives and financial assistance for farmers in the transitional phase was also highlighted. Issues around pesticide regulations and environmental standards came up as both potential avenues for action and limitations faced by countries. Additionally, the influence of agricultural policies from Europe and other importing nations on market accessibility for West African producers was examined.

- Markets: Participants emphasized the critical role of properly valuing and certifying sustainably grown agricultural products to boost income and encourage diversification among producers. However, several challenges with current initiatives were identified, such as inconsistent demand and the tendency to market these products without price differentiation. The group also noted that the benefits of certification are not evenly distributed, particularly for exported goods. Ensuring producers' access to higher-paying international markets was cited as a key concern. To strengthen these markets, investment from both public and private sectors is required, focusing on infrastructure, institutional support, training, and the implementation of participatory certification systems.

In summary, there was a strong consensus on the need for governance that involves multiple stakeholders and adopts an interdisciplinary approach.

Closing Speeches

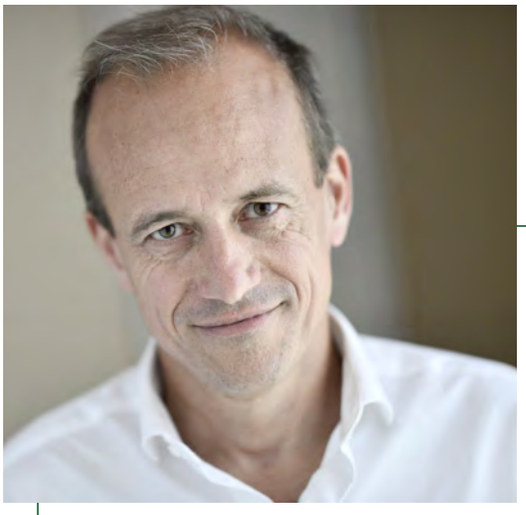
Drissa Traoré (MEMINADER)

Drissa Traoré, technical advisor at the Ministry of Agriculture of Côte d'Ivoire, underscored several insights during the seminar's conclusion. He pointed to the vulnerability of West African soils, which results from unsuitable farming methods and environmental challenges like land deterioration and climate change. Such factors of degradation have far-reaching repercussions, spanning environmental, agronomic, and socio-economic domains. Prior to any action, a comprehensive analysis is imperative.

Traoré suggested numerous strategies to address these concerns. Notably, the shift towards agroecology stands out as it fosters sustainable and climate-resilient farming methods. He also highlighted the significance of the "multifunctionality of forest landscapes" in establishing robust and diverse agricultural systems. Agroforestry, while promising, faces hurdles like land ownership disputes and insufficient financial motivations.

Furthermore, Traoré emphasized the urgency of enhancing soil fertility management, advocating for the integration of indigenous knowledge and sustainable practices. The critical collaboration between researchers and policymakers was emphasized to devise fitting solutions. He also noted the availability of financial tools designed to bolster soil conservation and rejuvenation efforts.

In summary, he recalled that the seminar shed light on the intricate issues surrounding soil degradation in West Africa, presenting various remedies. It underscored the crucial role of bridging science and policy, along with the need for financial backing, to realize these goals.



Jean-Paul Laclau (CIRAD)

Jean-Paul Laclau spoke on behalf of CIRAD, the organization coordinating the Terri4Sol project. He recalled the three primary goals of the seminar: to highlight the critical role of soil in addressing social, economic, and environmental challenges in West Africa; to facilitate cross-sectoral dialogue among institutions, the agricultural industry, NGOs, the private sector, and researchers; and to identify priority actions for better soil management.

Regarding the first goal, the seminar established the central role of soil not only in combating climate change but also in enhancing food security and sustainable water management. To achieve its second goal, the seminar enabled constructive dialogues among various stakeholders, primarily through roundtable discussions and group activities.

Priority actions were identified as follows:
1. Intersectorality: A multisectoral approach is essential as soil fertility is a complex issue that intersects with socio-economic, institutional, political, and environmental factors.
2. Scale Integration: Actions must be coherent across different scales, ranging from individual agricultural plots to national policies. CIRAD underscored the role of research in providing practical solutions.
3. Urgency: The time to act is now. Opportunities for low-cost, "passive" ecosystem restoration still exist but are quickly diminishing.
4. Dialogue among Stakeholders: Scientific insights must inform political decisions, and the political landscape should likewise be considered in scientific research.

Additional discussions covered topics like agroecological transitions, agroforestry, and landscape multifunctionality as integral parts of the overall solution. The Terri4Sol project was hailed as an exemplary model of the multidisciplinary approach needed to address these intricate issues. CIRAD and MeMINADER were also commended for their contributions to the 4 for 1000 Initiative in West Africa, which focuses on improved soil management.

In conclusion, effective soil management is vital for the economic, social, and environmental sustainability of agricultural sectors, not just in Côte d'Ivoire, but across the West African region. The seminar shed light on the nuanced, context-specific solutions required to ensure a sustainable future for agriculture.

Paul Luu (4 per 1000 Initiative)

Paul Luu emphasized the vital role of healthy soils not just for specific regions, but for the global community. He cited international initiatives like the UNCCD, COP 28, and COP 15 as crucial platforms for addressing soil degradation. Luu urged that soil should be a focal point in tackling global challenges like climate change and food insecurity, promoting initiatives like "4 for 1000" and CA4SH.

The seminar adopted a regional perspective, specifically discussing the critical economic sectors of cocoa and coffee production. These industries rely heavily on post-forest soils, which are especially susceptible to degradation. Expert discussions revolved around both the challenges and solutions in this context, including the need for sustainable soil management and supportive policy frameworks.

Luu delved into the rapid deterioration of post-forest soils, attributing it to decreasing organic matter and pesticide usage. He noted that soil carbon content is affected by multiple variables, including cultivation methods. While soil mapping was acknowledged as an essential tool for informed decision-making, there was a call to make it more user-friendly and actionable.

Several solutions were put forward, such as adopting agroforestry and agroecology systems. These approaches not only boost environmental resilience but also provide economic benefits to farmers. For instance, agroforestry allows for long-term cultivation of the same land, reducing the impulse for deforestation.

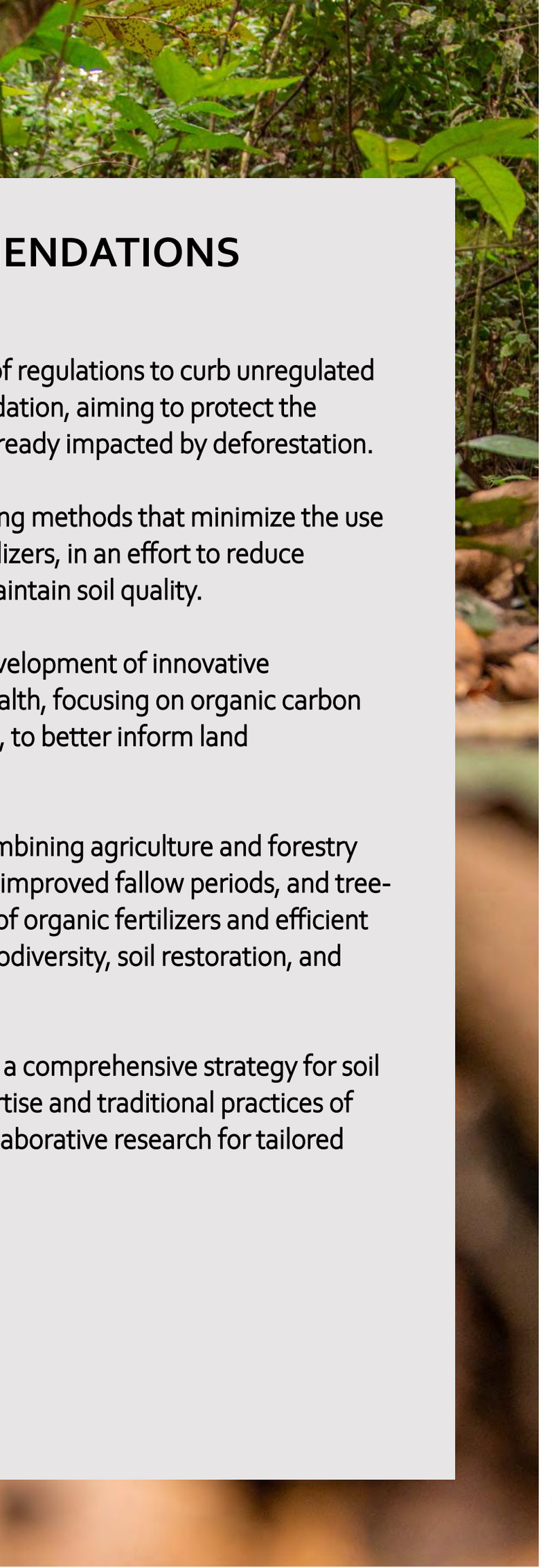
The discussion also stressed the importance of creating a conducive environment for farmers. This includes secure land ownership, financial incentives for transition phases, and easy access to a blend of scientific and traditional knowledge. A striking point made was that a mere 5% of product revenues reach the primary producers, underscoring the urgent need for fairer income distribution.

In conclusion, the seminar underscored the necessity of involving all stakeholders in the decision-making process. It advocated for stronger collaboration among policymakers, scientists, and field practitioners.

In his closing remarks, Mr. Rodrigue N'Guessan, the Director General of Rural Development in the Ministry of Agriculture, thanked attendees for their insightful contributions to the workshop. He emphasized that the recommendations and ideas put forth would serve as a strong foundation for advancing the agricultural sector. Additionally, N'Guessan praised international delegations for their expertise and commitment, stressing the significance of their involvement.

N'Guessan also commented on the workshop's collaborative and engaging atmosphere, noting that it had enabled the creation of top-notch recommendations. He underlined the importance of these discussions not only for Côte d'Ivoire but also for other countries in the ECOWAS and Central Africa region facing similar agricultural challenges.

In closing, the Director General expressed his desire to continue this collaborative effort to address future challenges in the sector. Representing the Minister of State and Minister of Agriculture and Rural Development, Mr. Kobenan KOUASSI ADJOUMANI, N'Guessan officially concluded the workshop, reiterating the importance of its recommendations in shaping a sustainable future for agriculture.



10 RECOMMENDATIONS

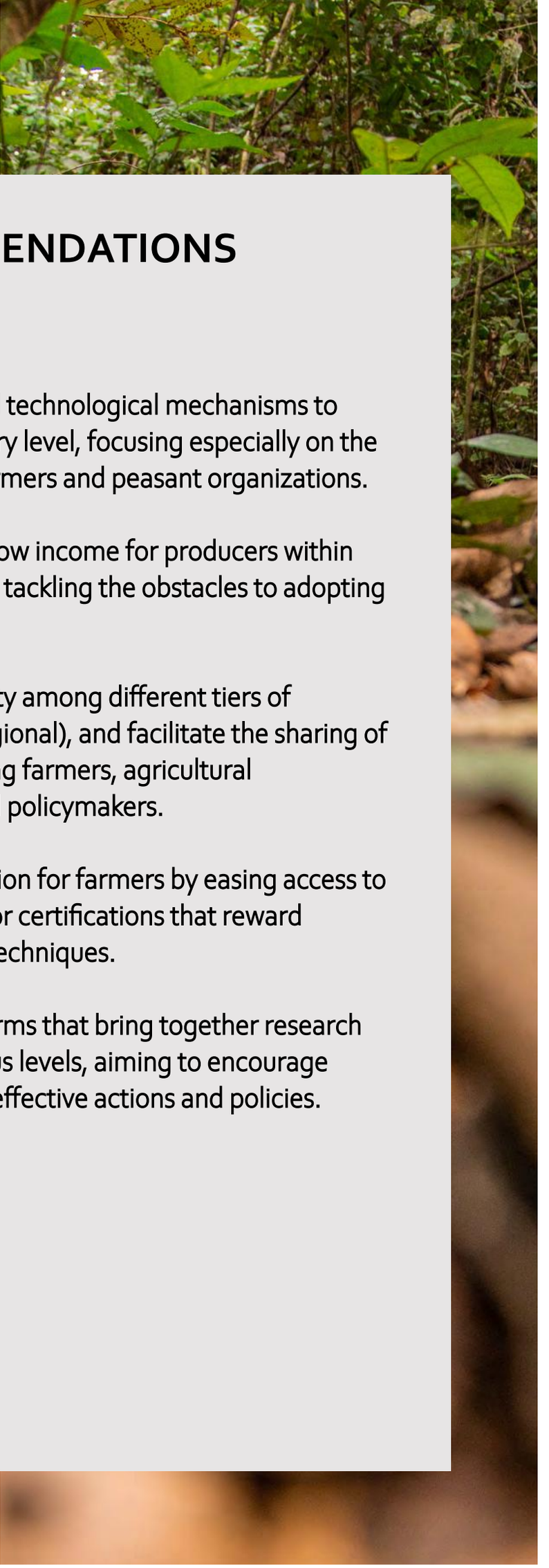
1. Ensure the implementation of regulations to curb unregulated deforestation and forest degradation, aiming to protect the remaining forest soil in areas already impacted by deforestation.

2. Encourage sustainable farming methods that minimize the use of pesticides and chemical fertilizers, in an effort to reduce environmental pollution and maintain soil quality.

3. Support the research and development of innovative techniques for assessing soil health, focusing on organic carbon levels and degradation markers, to better inform land management decisions.

4. Enhance farmers' skills in combining agriculture and forestry practices, such as agroforestry, improved fallow periods, and tree-lined fields. Encourage the use of organic fertilizers and efficient water management to boost biodiversity, soil restoration, and crop yields.

5. Advocate for agroecology as a comprehensive strategy for soil fertility, incorporating the expertise and traditional practices of local farmers, and fostering collaborative research for tailored solutions.



10 RECOMMENDATIONS

6. Develop strong financial and technological mechanisms to facilitate soil restoration at every level, focusing especially on the requirements of small-scale farmers and peasant organizations.

7. Address the critical issue of low income for producers within global supply chains, while also tackling the obstacles to adopting sustainability standards.

8. Foster collaboration and unity among different tiers of governance (local, national, regional), and facilitate the sharing of knowledge and expertise among farmers, agricultural organizations, researchers, and policymakers.

9. Enhance income diversification for farmers by easing access to new markets and advocating for certifications that reward sustainable soil management techniques.

10. Create collaborative platforms that bring together research and policymaking across various levels, aiming to encourage collective learning and inform effective actions and policies.